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Student:

Phase Transitions - Melting and Boiling

Objective: To understand the processes of melting and boiling as key examples of phase transitions.

1. What are Phase Transitions?

Phase Transitions: These are changes from one state of matter (solid, liquid, gas) to another. Common transitions include melting, freezing, boiling, and condensation.

2. Melting

Definition: Melting is the transition from a solid to a liquid

Melting Point: The temperature at which a substance changes from a solid to a liquid. It's constant for a pure substance under constant pressure.

Example: Ice melting into water is a typical example of melting.

3. Boiling

Definition: Boiling is the transition from a liquid to a gas, occurring throughout the liquid

Boiling Point: The temperature at which a liquid changes to a gas. This varies with atmospheric pressure; higher altitudes have lower boiling points.

Example: Water boiling into steam in a kettle.

In-Class Problems

Problem 1: Melting Ice

You take out a tray of ice cubes from the freezer. After a while, they start to melt. Why does ice at 0°C melt when the room temperature is above 0°C ?

Problem 2: Making Tea at High Altitudes

A group of hikers are making tea at a high-altitude campsite. How does the boiling point of water change at high altitudes and why? How does this affect the time taken to boil water for tea?

Problem 3: Salt on Icy Roads

In winter, road services often spread salt on icy roads. How does salt affect the melting point of ice, and why is this method used to make roads safer?